

CHAPTER IV

SUMMARY OF TROPICAL CYCLONES 1966

During 1966 the Joint Typhoon Warning Center issued a total of 752 tropical warnings on 20 typhoons, 10 tropical storms and 8 tropical depressions. Warnings were issued on two or more tropical cyclones simultaneously on a total of 46 calendar days; on 17 of the 46 days three tropical cyclones were in existence.

The following data for the JTWC area of responsibility is presented for comparison:

COMPARATIVE WESTERN PACIFIC TROPICAL CYCLONE DATA

	1959	1960	1961	1962	1963	1964	1965	1966
TOTAL NUMBER OF WARNINGS	583	776	738	815	663	730	805	752
CALENDAR DAYS OF WARNING	137	157	165	154	146	153	167	155
TROPICAL DEPRESSIONS	7	3	11	9	3	5	6	8*
TROPICAL STORMS	9	8	11	6	6	14	13	10
TYPHOONS	17	19	20	24	19	26	21	20
TOTAL TROPICAL CYCLONES	65	56	69	56	33	52	40	38*

*Cyclone number 22 was used by JHWC in Hawaii. This accounts for the difference between the cyclone numbers used versus the total tropical cyclones for the Western Pacific.

In the area of the North Pacific Ocean east of 180 degrees 342 warnings were issued on a total of 19 tropical cyclones (See Annex A). 1966 was an unusual year in that a tropical cyclone developed in the area between 140 degrees and 180 degrees west necessitating the transfer of a cyclone number (22) from FWC/JTWC to JHWC in Hawaii.

There were only 3 "Super Typhoons" (maximum sustained surface winds of 130 knots or greater) compared with a record 11 during 1965. The most intense storm of 1966 was Typhoon KIT (22-28 June) with a maximum sustained surface wind of 170 knots. The minimum 700mb height of 2095 meters was observed at 260227Z. The minimum sea level pressure was not observed at this time but was believed to have been less than the 914mb observed at 252100Z. The reconnaissance aircraft encountered severe hail and turbulence at 700mb during the 260227Z fix.

No example of the Fujiwhara Effect occurred during 1966. Typhoon SUSAN was absorbed in the circulation of Typhoon TESS on the 16th of August.

A study of rapid movement of some typhoons prior to becoming extra-tropical was made. There were only two good examples of this phenomenon this year -- Typhoon IDA (22-25 Sept) and Typhoon JUNE (22-29 Sept).

Another significant feature of a typhoon that occurred during the 1966 season was the development of a secondary vortex within the same general circulation of a storm system. This occurred first with Typhoon HESTER (03-14 April). The original vortex dissipated south of Guam and a second vortex formed within the same circulation further to the south. This situation is a duplication of what happened to Typhoon FAYE in the same geographical area during November 1965.

The second example of this phenomenon occurred as Typhoon JUDY (25-31 May) approached Taiwan on 30 May. An eddy effect occurred in the northern portion of the Formosa Straits creating a secondary center in that area. As the original center moved across southern Taiwan at 10 knots the new center moved across northern Taiwan at 15 knots and appeared to join the 500mb system and rapidly increase in forward speed to 25 knots by 310000Z. This was verified by a three hourly surface meso-analysis of the Taiwan reporting stations during this period. The existence of two centers was also evident on the APT readout of the ESSA II satellite.

An abnormal number of tropical cyclones developed in the South China Sea during the 1966 season. Another interesting feature was the development of 12 tropical cyclones within a 450 mile radius of Guam.

As in other years, the 24, 48 and 72-hour mean forecast error for each typhoon was computed by two methods. In addition to the standard mean forecast error (Tables IV-1 and IV-2), a computation of closest-distance (right angle) error from best track (Table IV-3) has been included for comparison. This error computation is based on the closest right angle distance of the forecast position to the best track without regard to time.

The following tabulation of the average forecast error for the past 17 years is given for comparison:

FORECAST VERIFICATION
AVERAGE ERROR NAUTICAL MILES

	24 HR	48 HR	72 HR
1950-58	170	---	---
1959	117	267	---
1960	177	354	---
1961	136	274	---
1962	144	287	476
1963	127	246	374
1964	133	284	429
1965	151	303	418
1966	136	280	432

TABLE IV-1

1966 AVERAGE FORECAST ERRORS*

TYPHOON	24 HR FORECASTS		48 HR FORECASTS		72 HR FORECASTS	
	NO. OF CASES	MEAN ERROR (MI)	NO. OF CASES	MEAN ERROR (MI)	NO. OF CASES	MEAN ERROR (MI)
HESTOR	30	76	18	123	9	171
IRMA	39	93	32	203	12	402
JUDY	23	114	16	261	5	344
KIT	23	142	15	449	6	846
MAMIE	7	194	--	--	--	--
NINA	7	105	--	--	--	--
ORA	9	131	1	366	--	--
RITA	22	155	8	284	4	645
SUSAN	13	97	5	301	--	--
TESS	14	90	5	260	--	--
VIOLA	9	218	5	476	--	--
ALICE	35	170	21	434	5	596
CORA	33	103	27	198	7	385
ELSIE	22	99	15	240	4	484
FLOSSIE	16	135	8	269	2	507
IDA	10	315	3	658	--	--
JUNE	25	211	19	412	7	435
KATHY	38	134	24	247	11	391
MARIE	18	254	12	343	4	478
PAMELA	17	61	12	119	3	164

AVERAGE ERROR - 24 HR FORECASTS (410 CASES) ... 136 MI

AVERAGE ERROR - 48 HR FORECASTS (246 CASES) ... 280 MI

AVERAGE ERROR - 72 HR FORECASTS (79 CASES) ... 432 MI

*Includes Forecast Errors during tropical storm intensity

TABLE IV-2

1966 FORECAST ERRORS*
(IN TERMS OF CLOSEST DISTANCE TO BEST TRACK)

TYPHOON	24 HR FORECASTS		48 HR FORECASTS		72 HR FORECASTS	
	NO. OF CASES	MEAN ERROR (MI)	NO. OF CASES	MEAN ERROR (MI)	NO. OF CASES	MEAN ERROR (MI)
HESTER	25	36	18	74	9	70
IRMA	37	60	32	135	12	236
JUDY	21	54	15	103	5	127
KIT	19	114	15	262	6	466
MAMIE	4	58	--	--	--	--
NINA	8	94	1	163	--	--
ORA	4	32	--	--	--	--
RITA	19	54	8	126	4	455
SUSAN	12	55	5	187	--	--
TESS	10	48	5	200	--	--
VIOLA	12	81	8	151	2	314
ALICE	35	103	21	339	5	454
CORA	31	58	29	134	8	199
ELSIE	22	65	15	149	4	298
FLOSSIE	12	72	8	161	2	143
IDA	10	64	3	68	--	--
JUNE	24	142	19	263	7	193
KATHY	26	48	19	89	11	186
MARIE	17	129	12	158	4	108
PAMELA	17	21	12	39	3	63

AVERAGE ERROR - 24 HR FORECASTS (365 CASES) ... 71 MI

AVERAGE ERROR - 48 HR FORECASTS (245 CASES) ... 160 MI

AVERAGE ERROR - 72 HR FORECASTS (81 CASES) ... 229 MI

*Includes Forecast Errors during tropical storm intensity

TABLE IV-3

To better understand the areas in which larger or smaller errors occur, the mean and right angle errors are tabulated with respect to latitude for the 24, 48 and 72 hour forecast positions (table IV-4). Also distances from positions given in the bulletins versus the best track positions is summarized (table IV-5). Possibly this information will give the user a better understanding of the ability of JTWC to forecast the effects of a typhoon in a particular area.

FORECAST ERROR TABULATION (MI) - 1966

	NUMBER OF CASES	ERROR		RIGHT ANGLE	
		MEAN	R.M.S.	MEAN	R.M.S.
<u>24 Hour</u>					
Total	365	136	165	71	95
Below 20N	131	104	131	58	83
20N-30N	191	142	166	75	102
Above 30N	43	20.7	240	79	100
Below 35N	351	132	159	70	94
Above 35N	14	241	281	106	122
<u>48 Hour</u>					
Total	245	283	332	160	206
Below 20N	70	170	197	98	127
20N-30N	136	310	354	191	240
Above 30N	39	389	433	163	190
Below 35N	232	272	320	163	209
Above 35N	13	478	505	113	146
<u>72 Hour</u>					
Total	81	439	513	229	287
Below 20N	20	214	260	108	129
20N-30N	45	466	521	258	309
Above 30N	16	646	695	299	358
Below 35N	75	422	495	224	286
Above 35N	6	653	694	297	298

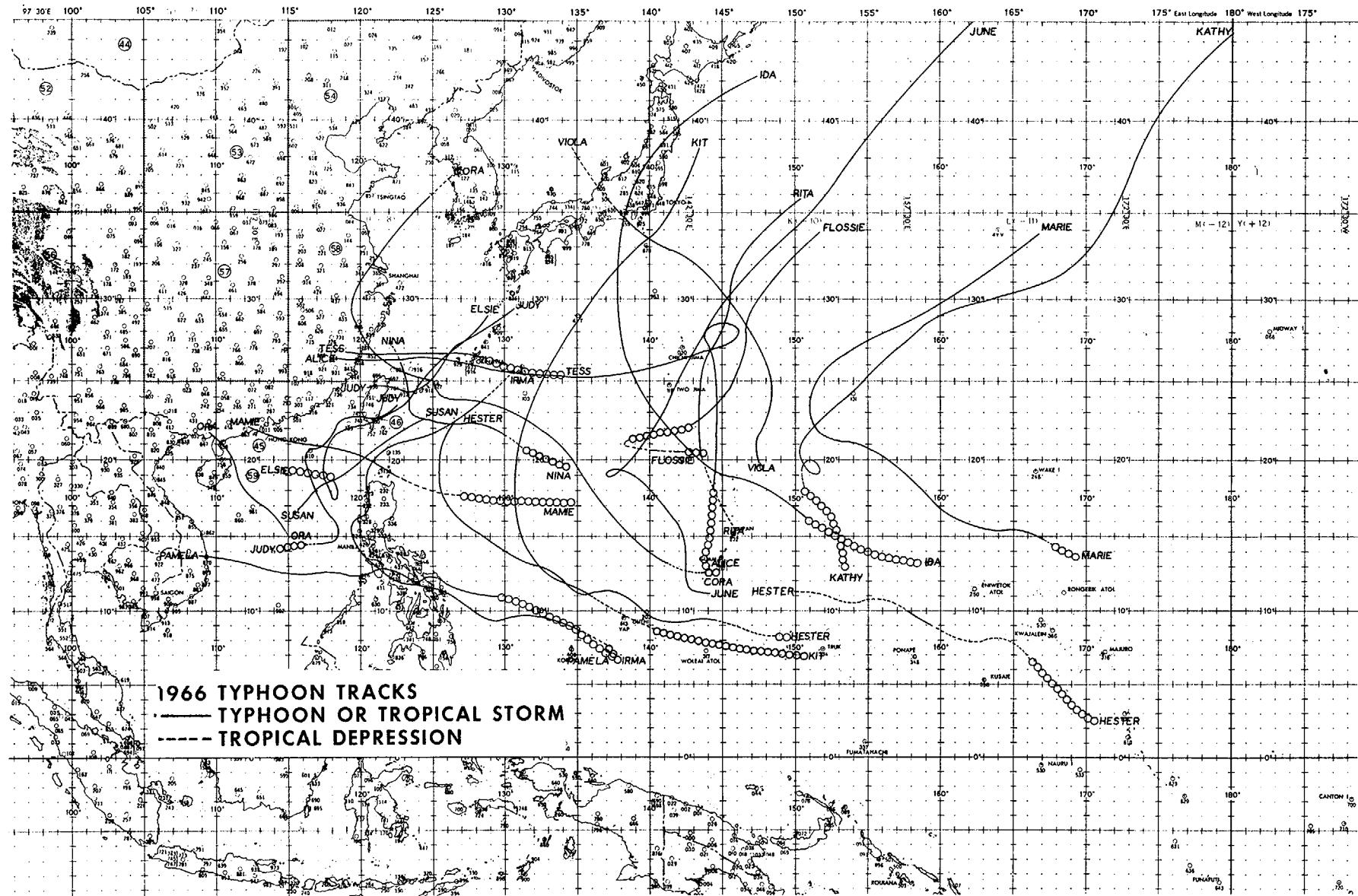
TABLE IV-4

DISTANCE BETWEEN OPERATIONAL WARNING
POSITS AND BEST TRACK POSITS

CYCLONE	CASES	CYCLONE AVERAGE (MI)	MAX (MI)	MIN (MI)
1. HESTER	47	25	105	03
2. IRMA	44	22	132	05
3. JUDY	28	20	58	00
4. KIT	28	26	94	00
5. LOLA	10	42	102	05
6. MAMIE	11	44	113	07
7. NINA	13	25	54	05
8. ORA	13	35	77	00
9. PHYLLIS	9	26	57	08
10. RITA	28	30	92	05
11. SUSAN	17	22	83	02
12. TESS	19	20	75	05
13. T.D.	4	47	93	15
14. VIOLA	16	19	49	04
15. WINNIE	15	20	59	04
16. ALICE	39	16	47	00
17. BETTY	6	17	57	00
18. CORA	40	29	133	05
19. T.D.	5	42	65	06
20. T.D.	17	94	256	07
21. DORIS	16	24	54	04
22. T.D.	10	31	118	00
23. ELSIE	26	22	69	01
24. FLOSSIE	20	42	131	06
25. GRACE	11	61	119	06
26. HELEN	21	28	46	04
27. IDA	14	37	83	04
28. JUNE	30	38	200	00
29. KATHY	49	41	260	04
30. T.D.	12	46	250	13
31. T.D.	5	101	67	00
32. LORNA	26	23	81	00
33. MARIE	22	44	146	06
34. T.D.	8	38	91	12
35. T.D.	5	48	125	05
36. NANCY	32	29	164	02
37. OLGA	13	32	138	01
38. T.D.	6	78	202	15
39. PAMELA	23	18	48	02

OVERALL AVERAGE 31.5

TABLE IV-5



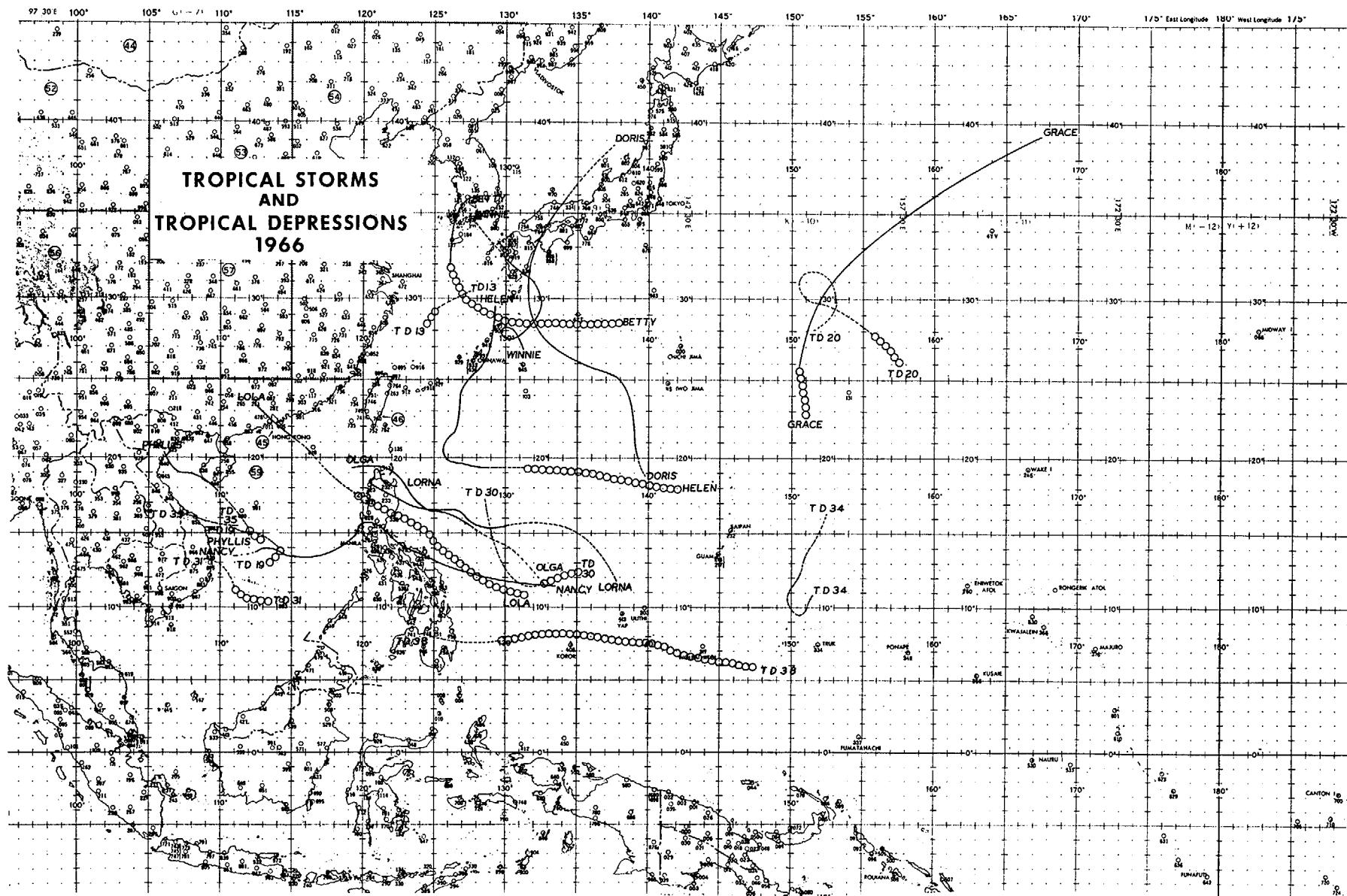
1966 TROPICAL CYCLONES

CYCLONE	TYPE	NAME	*DATE	*CALENDAR		*MAX	MIN	MAX	TOTAL	NO.	NO. WARNINGS	*DISTANCE
				WARNINGS	OF	SFC	OBS	RADIUS	WARNINGS	ISSUED AS		
				WARNING	WNDS	SLP	SFC	CIRC	ISSUED	TYphoon		TRAVELED
01	T	HESTER	03 APR-14 APR	12	85	979	360	47	15		2676	
02	T	IRMA	11 MAY-22 MAY	12	120	970	350	44	28		2150	
03	T	JUDY	25 MAY-31 MAY	7	85	970	350	28	14		1536	
04	T	KIT	22 JUN-28 JUN	7	170	914	600	28	19		2286	
05	TS	LOLA	11 JUL-14 JUL	4	60	992	290	10	-		552	
06	T	MAMIE	15 JUL-17 JUL	3	85	987	225	11	3		882	
07	T	NINA	17 JUL-20 JUL	4	65	995	200	13	1		702	
08	T	ORA	23 JUL-26 JUL	4	85	977	450	13	8		516	
09	TS	PHYLLIS	31 JUL-02 AUG	3	45	991	160	9	-		456	
10	T	RITA	02 AUG-09 AUG	8	80	977	500	28	4		1332	
11	T	SUSAN	12 AUG-16 AUG	5	80	978	275	17	3		606	
12	T	TESS	12 AUG-17 AUG	6	90	972	400	19	4		522	
13	TD		17 AUG-18 AUG	1	30	994	155	4	-		108	
14	T	VIOLA	19 AUG-22 AUG	4	90	975	275	16	9		1404	
15	TS	WINNIE	20 AUG-24 AUG	4	60	971	310	15	-		750	
16	T	ALICE	25 AUG-03 SEP	10	130	937	350	39	18		2238	
17	TS	BETTY	29 AUG-30 AUG	2	60	---	170	6	-		240	
18	T	CORA	30 AUG-09 SEP	11	150	917	600	39	24		2358	
19	TD		01 SEP-02 SEP	2	30	1001	180	5	-		202	
20	TD		05 SEP-09 SEP	5	30	998	165	17	-		660	
21	TS	DORIS	06 SEP-10 SEP	5	50	979	160	16	-		1494	
22	TD		10 SEP-12 SEP	3	30	1004	240	10	-		540	
23	T	ELSIE	11 SEP-18 SEP	8	115	943	400	26	16		1134	
24	T	FLOSSIE	12 SEP-18 SEP	7	75	963	350	21	4		1122	
25	TS	GRACE	14 SEP-17 SEP	4	60	972	270	11	-		1212	
26	TS	HELEN	19 SEP-24 SEP	6	60	982	630	21	-		936	
27	T	IDA	22 SEP-25 SEP	4	100	961	225	14	8		2112	

1966 TROPICAL CYCLONES (Cont'd)

CYCLONE	TYPE	NAME	*DATE	*CALENDAR		*MAX	MIN	MAX	TOTAL	NO.	NO.	WARNINGS	*DISTANCE
				DAY'S OF	WARNING	SFC	OBS	RADIUS	WARNINGS	ISSUED AS			
				WNDS	SLP	SFC	CIRC	ISSUED	TYphoon				TRAVELED
28	T	JUNE	22 SEP-29 SEP	8	95	962	475		30	8			2898
29	T	KATHY	08 OCT-20 OCT	13	100	947	500		49	41			2466
30	TD		09 OCT-12 OCT	4	30	998	245		13	-			462
31	TD		21 OCT-25 OCT	5	25	1001	230		5	-			168
32	TS	LORNA	27 OCT-02 NOV	7	60	952	375		26	-			1320
33	T	MARIE	29 OCT-04 NOV	7	100	946	550		23	17			2196
34	TD		31 OCT-02 NOV	3	30	995	210		9	-			540
35	TD		11 NOV-12 NOV	2	25	1005	150		5	-			216
36	TS	NANCY	18 NOV-26 NOV	9	60	976	370		32	-			1326
37	TS	OLGA	22 NOV-25 NOV	4	45	993	245		14	-			942
38	TD		18 DEC-19 DEC	2	30	999	150		6	-			282
39	T	PAMELA	25 DEC-31 DEC	7	90	967	275		23	10			1224
68			TOTALS		222				762	254			

*DATA TAKEN FROM BEST TRACK



TROPICAL STORMS 1966
POSITION DATA

TROPICAL STORM LOLA
11 JUL-14 JUL

DTG	LAT	LONG	DTG	LAT	LONG
111800Z	17.6N	119.5E	130000Z	20.9N	115.6E
120000Z	18.2N	118.7E	130600Z	21.5N	114.8E
120600Z	18.8N	117.8E	131200Z	22.2N	113.9E
121200Z	19.6N	117.2E	131800Z	22.8N	113.1E
121800Z	20.3N	116.4E	140000Z	23.7N	112.2E

TROPICAL STORM PHYLLIS
31 JUL-02 AUG

DTG	LAT	LONG	DTG	LAT	LONG
311800Z	15.3N	112.0E	020000Z	18.7N	108.2E
010000Z	16.1N	111.2E	010600Z	19.0N	107.2E
010600Z	16.8N	110.5E	021200Z	19.3N	106.7E
011200Z	17.6N	109.9E	021800Z	20.2N	106.1E
011800Z	18.4N	109.2E			

TROPICAL STORM WINNIE
20 AUG-24 AUG

DTG	LAT	LONG	DTG	LAT	LONG
201200Z	26.9N	131.2E	220600Z	29.3N	132.4E
201800Z	27.3N	130.9E	221200Z	30.3N	132.3E
210000Z	27.7N	130.6E	221800Z	31.2N	131.6E
210600Z	28.1N	130.3E	230000Z	31.8N	130.7E
211200Z	27.8N	129.7E	230600Z	32.5N	129.8E
211800Z	27.6N	130.8E	231200Z	33.3N	129.0E
220000Z	28.4N	131.9E	231800Z	34.0N	128.2E
			240000Z	34.7N	127.4E

TROPICAL STORM BETTY
29 AUG-30 AUG

DTG	LAT	LONG	DTG	LAT	LONG
291200Z	32.0N	126.2E	300600Z	34.5N	126.5E
291800Z	32.8N	126.2E	301200Z	35.2N	126.8E
300000Z	33.7N	126.3E	301800Z	35.8N	127.5E

TROPICAL STORM DORIS
06 SEP-10 SEP

DTG	LAT	LONG	DTG	LAT	LONG
060600Z	18.7N	139.7E	080600Z	27.2N	132.9E
061200Z	19.2N	139.5E	081200Z	28.8N	131.9E
061800Z	19.9N	139.2E	081800Z	30.6N	131.7E
070000Z	21.3N	139.0E	090000Z	31.8N	131.7E
070600Z	23.3N	138.8E	090600Z	33.5N	132.3E
071200Z	25.1N	137.8E	091200Z	35.3N	133.5E
071800Z	25.5N	136.2E	091800Z	37.0N	135.2E
080000Z	26.1N	134.4E	100000Z	38.7N	137.5E

TROPICAL STORM GRACE
14 SEP-17 SEP

DTG	LAT	LONG	DTG	LAT	LONG
141200Z	25.7N	150.5E	160000Z	34.1N	156.9E
141800Z	26.7N	150.7E	160600Z	35.5N	159.4E
150000Z	27.9N	151.1E	161200Z	36.9N	161.9E
150600Z	29.0N	151.6E	161800Z	38.2N	164.5E
151200Z	30.7N	152.8E	170000Z	39.1N	167.3E
151800Z	32.5N	154.7E			

TROPICAL STORM HELEN
19 SEP-24 SEP

DTG	LAT	LONG	DTG	LAT	LONG
190000Z	19.4N	131.3E	211800Z	21.6N	126.3E
190600Z	19.4N	130.8E	220000Z	22.3N	126.8E
191200Z	19.4N	130.3E	220600Z	23.1N	126.9E
191800Z	19.3N	129.6E	221200Z	24.0N	126.9E
200000Z	19.3N	129.0E	221800Z	24.7N	127.2E
200600Z	19.4N	128.3E	230000Z	25.3N	127.8E
201200Z	19.5N	127.7E	230600Z	26.1N	128.5E
201800Z	19.6N	127.1E	231200Z	27.0N	128.8E
210000Z	19.6N	126.5E	231800Z	28.2N	129.1E
210600Z	20.1N	125.8E	240000Z	29.6N	129.3E
211200Z	20.9N	125.9E			

TROPICAL STORM LORNA
27 OCT-02 NOV

DTG	LAT	LONG	DTG	LAT	LONG
270600Z	11.6N	137.7E	301200Z	16.6N	125.5E
271200Z	12.0N	136.6E	301800Z	16.6N	124.4E
271800Z	12.4N	137.5E	310000Z	16.9N	123.3E
280000Z	12.9N	137.2E	310600Z	17.4N	122.3E
280600Z	13.6N	136.8E	311200Z	18.0N	121.3E
281200Z	14.3N	136.0E	311800Z	18.3N	120.7E
281800Z	15.1N	134.7E	010000Z	18.6N	120.6E
290000Z	15.6N	133.3E	010600Z	19.0N	120.8E
290600Z	15.7N	131.8E	011200Z	19.1N	121.0E
291200Z	15.5N	130.2E	011800Z	18.7N	121.2E
291800Z	15.3N	128.7E	020000Z	18.4N	121.4E
300000Z	15.8N	127.5E	020600Z	18.2N	121.7E
300600Z	16.5N	126.5E	021200Z	18.1N	122.2E

TROPICAL STORM NANCY
18 NOV-26 NOV

DTG	LAT	LONG	DTG	LAT	LONG
180600Z	11.5N	132.5E	220600Z	13.9N	118.1E
181200Z	11.7N	130.8E	221200Z	13.7N	117.5E
181800Z	11.9N	129.1E	221800Z	13.6N	116.8E
190000Z	12.3N	127.5E	230000Z	13.5N	116.3E
190600Z	12.7N	126.1E	230600Z	13.5N	115.8E
191200Z	13.2N	125.0E	231200Z	13.5N	115.1E
191800Z	13.7N	123.9E	231800Z	13.7N	114.4E
200000Z	14.1N	123.0E	240000Z	13.8N	114.1E
200600Z	14.6N	122.1E	240600Z	13.9N	113.9E
201200Z	15.1N	121.4E	241200Z	14.0N	113.7E
201800Z	15.5N	120.8E	241800Z	14.1N	113.3E
210000Z	15.6N	120.2E	250000Z	13.9N	112.9E
210600Z	15.4N	119.8E	250600Z	13.8N	112.4E
211200Z	14.9N	119.4E	251200Z	13.6N	111.9E
211800Z	14.4N	119.0E	251800Z	13.5N	111.4E
220000Z	14.1N	118.6E	260000Z	13.3N	110.9E

TROPICAL STORM OLGA
22 NOV-25 NOV

DTG	LAT	LONG	DTG	LAT	LONG
220600Z	11.6N	132.7E	240000Z	17.2N	123.5E
221200Z	12.8N	131.8E	240600Z	18.6N	122.7E
221800Z	13.9N	130.5E	241200Z	19.4N	121.3E
230000Z	14.6N	128.9E	241800Z	19.5N	120.0E
230600Z	15.4N	127.5E	250000Z	19.5N	119.7E
231200Z	16.1N	126.2E	250600Z	19.4N	119.4E
231800Z	16.6N	124.8E			

TROPICAL DEPRESSIONS 1966
POSITION DATA

TROPICAL DEPRESSION ONE THREE
17 AUG-18 AUG

DTG	LAT	LONG	DTG	LAT	LONG
171200Z	29.4N	125.2E	180000Z	29.9N	126.6E
171800Z	29.7N	125.9E	180600Z	30.2N	127.4E

TROPICAL DEPRESSION ONE NINE
01 SEP-02 SEP

DTG	LAT	LONG	DTG	LAT	LONG
010000Z	14.0N	114.0E	011800Z	15.0N	112.0E
010600Z	14.6N	113.6E	020000Z	15.2N	110.9E
011200Z	14.9N	113.0E			

TROPICAL DEPRESSION TWO ZERO
05 SEP-09 SEP

DTG	LAT	LONG	DTG	LAT	LONG
050600Z	27.9N	155.5E	071200Z	31.5N	151.6E
051200Z	28.3N	154.9E	071800Z	31.2N	152.2E
051800Z	28.7N	154.3E	080000Z	30.7N	152.7E
060000Z	29.1N	153.4E	080600Z	30.2N	152.9E
060600Z	29.4N	152.5E	081200Z	29.5N	153.0E
061200Z	29.7N	151.7E	081800Z	28.9N	152.8E
061800Z	30.1N	150.9E	090000Z	28.5N	152.3E
070000Z	30.8N	150.5E	090600Z	28.0N	151.5E
070600Z	31.3N	150.9E			

TROPICAL DEPRESSION TWO TWO
10 SEP-12 SEP

DTG	LAT	LONG	DTG	LAT	LONG
101800Z	15.3N	149.0W	120000Z	15.2N	153.2W
110000Z	15.2N	149.5W	120600Z	15.2N	154.6W
110600Z	15.2N	150.0W	121200Z	15.1N	156.2W
111200Z	15.2N	151.0W	121800Z	14.9N	157.6W
111800Z	15.2N	152.0W	122100Z	14.8N	158.4W

TROPICAL DEPRESSION THREE ZERO
09 OCT-12 OCT

DTG	LAT	LONG	DTG	LAT	LONG
090600Z	11.5N	132.4E	101800Z	13.9N	129.4E
091200Z	11.5N	131.7E	110000Z	14.6N	129.2E
091800Z	11.6N	131.0E	110600Z	15.2N	129.0E
100000Z	12.1N	130.4E	111200Z	15.9N	128.8E
100600Z	12.7N	130.0E	111800Z	16.6N	128.7E
101200Z	13.3N	129.7E	120000Z	17.2N	128.6E

TROPICAL DEPRESSION THREE ONE
21 SEP-22 SEP

DTG	LAT	LONG	DTG	LAT	LONG
211200Z	11.5N	111.0E	220600Z	13.0N	109.9E
211800Z	12.1N	110.8E	221200Z	13.2N	108.9E
220000Z	12.6N	110.4E			

TROPICAL DEPRESSION THREE FOUR
31 OCT-02 NOV

DTG	LAT	LONG	DTG	LAT	LONG
310600Z	10.9N	151.6E	010600Z	13.0N	150.9E
311200Z	09.7N	150.8E	011200Z	14.1N	151.4E
311800Z	10.7N	149.8E	011800Z	15.2N	152.0E
010000Z	11.9N	150.4E	020000Z	16.3N	152.3E

TROPICAL DEPRESSION THREE FIVE
11 NOV-12 NOV

DTG	LAT	LONG	DTG	LAT	LONG
110600Z	15.4N	111.1E	120000Z	16.0N	108.3E
111200Z	15.5N	110.0E	120600Z	16.2N	107.4E
111800Z	15.7N	109.2E			

TROPICAL DEPRESSION THREE EIGHT
18 DEC-19 DEC

DTG	LAT	LONG	DTG	LAT	LONG
180000Z	07.7N	129.5E	181800Z	07.7N	126.6E
180600Z	07.6N	128.5E	190000Z	07.8N	125.7E
181200Z	07.6N	127.5E	190600Z	07.9N	124.8E